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viewpoint

A forum for 'doing society and genomics'

SSS Science & Society Series on Convergence Research

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The idea of 'doing society and genomics' raises interesting questions around what kinds of space, venue and activity might usefully contribute to such efforts. In 2004, the UK Economic and Social Research Council (ESRC; Swindon, UK) funded the creation of a new and experimental institute for genomics and society work: the ESRC Genomics Policy and Research Forum (University of Edinburgh, UK). With the second phase of funding for the Forum commencing in August 2009, the 'Doing Society and Genomics' workshop, hosted by the Dutch Centre for Society and Genomics (CSG; Radboud University, Nijmegen, the Netherlands) in September 2008, provided a timely opportunity for reflection on the Forum's first few years of activity.

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The Forum is part of the ESRC Genomics Network (EGN; www.genomicsnetwork.ac.uk), which is a UK-wide network of social science research centres that examines social, legal, ethical and regulatory issues associated with developments in genomics and the life sciences more generally. Importantly, and unlike the three principal research centres in the network—Cesagen (Universities of Cardiff and Lancaster, UK), Egenis (University of Exeter, UK) and Innogen (University of Edinburgh and the Open University, UK)—the Forum is not primarily a research unit, despite being based within an academic institution. Nor is it a press office or communications unit of the sort increasingly associated with research centres. Instead, the Forum has a remit to help connect social science research and thinking with a range of actors, including natural scientists, policy representatives and public groups: "[The Forum] acts to integrate the diverse strands of social science research within and beyond the EGN; to develop links between social scientists and scientists working across the entire range of genomic science and technology; and to connect research in this area to policy makers, business, the media and civil society in the UK and abroad" (www.genomicsnetwork.ac.uk/forum/aboutus).

This might seem like an ambitiously broad remit for what, in practice, is a small organization. Yet, the quotation speaks strongly to notions of 'doing society and genomics', and the Forum seems to have been cast as an intermediary in this activity. Arguably, there are many possible approaches to this role of intermediary. For example, as a 'boundary-spanning' institution, should the Forum serve as a relatively passive or neutral space in which groups can interact freely? Or should it take a more active role, engineering or brokering knowledge-exchange opportunities, and becoming involved in the process of translating research and findings across different groups? In the latter case, should the Forum strive to build consensus among its various target groups? Should it perhaps take a normative stance, proposing recommendations and encouraging groups to adopt particular ways of thinking? The answer is almost certainly 'it depends', and in practice the Forum experiments with each of these roles depending on the particular context or circumstances.

Similarly, when building new and experimental entities such as the Forum, many different structure–function relationships might be proposed. At present, the Forum is led by a director and a deputy director—both social scientists with expertise in science and technology studies (STS)—together with a core support staff comprising experts in press and communications, web design and event management. There are also small numbers of research fellows and policy fellows, typically post-doctoral, and a rotating cast of visiting fellows from the worlds of social, natural and medical sciences, policy and the creative arts.

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The types of activity coordinated by the Forum are varied and include interdisciplinary workshops and seminars, 'short courses' for PhD students and junior researchers, policy-briefing sessions, 'salon evenings', public events—particularly at the Edinburgh International Book Festival and during the UK National Science and Social Science weeks—and the publication of regular newsletters as well as an online peer-reviewed journal, *Genomics, Society and Policy*. Given its position as part of the EGN, the starting points for many of the activities of the Forum are the research and expertise found within the EGN.

To provide some structure for its activities, the Forum has set up several 'workstreams' that draw on broad themes featured

in the research of the other EGN centres. These include workstreams on both plant genomics and synthetic biology, which I discuss in some detail below, as well as workstreams with themes such as genomics and biosecurity, genomics and intellectual property, and a series of interdisciplinary activities on stem cells. These Forum-led initiatives attempt to synthesize and integrate EGN research with the thinking and activities of other communities. Of course, it should be said that as well as running workstreams and organizing events, Forum staff also participate widely in externally organized activities including workshops, consultation exercises and citizens' inquiries, task forces, and educational initiatives at both secondary school and university levels.

I came to the Forum as a research fellow in May 2006. Having completed my PhD—which focused on cell signalling and cell migration in inflammatory diseases—and then having spent two years working at the journal *Nature* in London, the Forum position seemed like a career move that would allow me to explore my growing interest in the relationship between the life sciences, policy and society. A neophyte in the world of social science, my core task at the Forum was to set up a workstream on plant genomics, which was one of the general themes identified on the basis of ongoing research activities across the EGN.

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The main Focus for the plant genomics activities has been at the interface of academic research and policy. Plants might take second place in general awareness to some of the more health- and medically related aspects of genomics, but they are deeply connected to issues such as climate change, biodiversity loss, agricultural productivity and food security—issues that are of growing importance on many political agendas, and which arguably call for interdisciplinary research and innovative policy interventions. Furthermore, growing calls to transition away from an oil-dependent economy towards a more 'bio-based' economy stem in part from scientific advances that increasingly allow us to derive energy and other useful materials from plants. How should we understand this rapidly changing context? How might research on plant genomics from natural science and social science perspectives contribute to emerging debates? And how might one go about trying to foster these interdisciplinary discussions?

Rather than starting with EGN research findings and identifying target audiences for dissemination—a strategy that requires a reasonable understanding of what such audiences might see as important findings—we adopted the reverse approach for this workstream. The aims were to build relationships with key individuals or groups external to the EGN, to identify issues of importance to these groups, and then to see how research being done in the EGN and in other relevant institutions might contribute to their work. The core external participants have been a small group of experts comprising three senior scientists with expertise in plant genetics, plant breeding and plant pathology, and one senior policy advisor from the UK government statutory advisory body on conservation. Together with a sociologist from the EGN and myself, we have defined the terms and scope of the workstream. The external committee members were all interested in better understanding how social science research might inform their work and thinking—the growing push to demonstrate the societal 'impact' of scientific research and to develop 'evidence-based' policy is leading to greater awareness of the need for interdisciplinary dialogue across the natural and social sciences. Although there was a general sense that EGN research findings might be relevant to the concerns of our steering committee, the challenge for the group rested in identifying how best to engage with the material, and understanding how it might, in practice, contribute to different work practices and strategic priorities. At its most basic level, the plant genomics workstream can be seen as an exercise in knowledge exchange and competence building.

Our activities over the past two years have consisted of a number of meetings that, in different ways, have tried to build bridges and develop a common language or framework with which to discuss matters relevant to plant genomics and society. As a group, we initially identified three broad and overlapping areas to which the fruits of plant genomics research might be applied: conservation and biodiversity, agriculture and the development of a bio-based economy, and alien species and biosecurity. We also identified several cross-cutting issues such as climate change, land use and food security. We then hosted a series of interdisciplinary workshops, structured around the three central themes, in order to map out the core issues and identify areas of overlap, discordance or synergy between different research and policy communities.

The workshops involved an average of 30 participants each, including natural and social scientists from a range of specialist disciplines, as well as policy officials and representatives from industry and non-governmental organizations. To provide some structure, a working paper was circulated before each workshop in which questions for discussion were framed to encourage participation—for example, focusing on identifying common issues or differences of opinion. In practice, these meetings have provided a neutral setting in which to explore different perspectives and question the underlying assumptions of different approaches to a given problem. Consensus or resolution of the often complex issues has not been a primary goal. Follow-up reports have been published from the meetings, and participants have been encouraged to stay in contact. For example, stemming from the workshop on plant breeding and intellectual property, one of the senior plant scientists on the steering committee is currently preparing a joint article with researchers from three EGN centres—a nice example of interdisciplinary collaboration.

Naturally, the steering committee members for the plant genomics workstream have taken part in these interdisciplinary workshops. After each one, we sat down to reflect on the discussions, and tried to capture some of the trends and broader issues that we thought were emerging. To help further these conversations, we experimented with a different type of interdisciplinary encounter in which groups of two or three senior scholars from across the humanities and social sciences—anthropology, sociology, political philosophy, geography, development studies, environmental economics and so on—were invited to take part in a day's discussion with the steering committee. We asked the invited experts to comment on a short 'think piece' that we had written about these emerging trends, and to introduce us to key approaches

Science & Society Series on Convergence Research

This article is part of the *EMBO reports* Science & Society Series on Convergence Research, which features Viewpoints from authors who attended the 'Doing Society and Genomics—Convergence and Competence Building' workshop organized by Peter Stegmaier for the Centre for Society and Genomics at Radboud University (Nijmegen, the Netherlands) in September 2008. We hope that this Viewpoint series will help to introduce our readers to the new multi- and transdisciplinary developments among the life sciences and the social sciences and humanities.

from their disciplines that might extend our thinking on these issues.

By bringing various perspectives to the table in these informal meetings, we have been able to explore many issues within what we have come to describe broadly as 'the politics of plants'. The following are a few examples of topics that we have discussed: How might our relationship with the 'natural' world change as the possibilities offered by modern biotechnology increase? What does 'conservation' mean in the context of climate change? Is there a growing tension between human rights and property rights, between what we might see as 'a good and just life' and our increasing tendency to make property claims on biological products and processes? What do we mean by plant science research for the 'public good'? Can we see the debate surrounding biofuels as reflecting a broader conflict between food and energy systems, which have different production and consumption chains, and quite distinct political and economic structures? All of these questions relate in different ways to the evolving relationship between plant science and society, and to address them constructively, an appreciation of the scientific, technical, social and policy issues is desirable.

Our initial think piece has now been revised into an article for the inaugural issue of the new interdisciplinary journal *Food Security* (Frow *et al*, 2009). This publication attempts to describe the new politics of plants that are emerging alongside the push to develop an increasingly bio-based economy. It integrates thinking from the natural and social sciences, and outlines a framework and agenda for future interdisciplinary research. Rather than treating this as an endpoint of our activities, we see the article as the basis for stimulating comments and discussion with a wider audience. The next stage of our work will involve dissemination through conference presentations, stimulation of dialogue through workshops at plant bioscience institutes, and policy-oriented discussion. The themes and concerns emerging from these activities will, in turn, be fed into research-strategy discussions within the EGN, ideally resulting in growing and reciprocal links across the natural and social sciences.

In a more general sense, how might we begin to evaluate the 'success' of the plant genomics workstream so far? This has not been an empirical research project and our goals were not tightly defined from the outset. Instead, we saw this as a unique opportunity to experiment with interdisciplinary engagement—a luxury that many formal research proposals do not allow for. The trajectory of the plant genomics workstream continues to develop in an organic way. Over the course of several encounters, a shared or common understanding seems to have evolved within the steering committee, as witnessed, for example, by the flurry of articles and noteworthy items exchanged within the group when we meet. Indeed, the repeated interaction of a small group has been a key element of this project. The enrolment of senior scientists and policy advisors has also been crucial—although the demands on their time are fierce, they have the autonomy to participate in such activities if they deem them to be worthwhile. Moreover, they have been in a position to effect change in their institutions on the basis of our discussions.

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There are encouraging signs that changes in working practices are beginning to filter down through the home institutions of the steering committee members. For example, one member has now hired a social scientist to work within his organization. Another blocked out a week in his diary to spend as a visiting fellow at the Forum, and is now in the process of setting up an interdisciplinary seminar series with social science research groups in his institution. There have also been synergies with respect to substantive matters discussed during the workstream meetings: for example, our workshop on bioenergy was timely from a policy perspective, and we have been told that discussions from this meeting influenced the production of policy documents on the topic. Importantly, some of these opportunities and synergies could not easily have been predicted *a priori*, and would probably have been missed had we taken a more conventional approach and tried to 'match' EGN research findings with particular target audiences.

Reflecting more generally on the achievements of the plant genomics workstream, it occurs to me that the development of new 'framings' or lenses through which to view issues relevant to genomics and society, such as the 'politics of plants' agenda that our steering committee has developed, are a more likely outcome of early attempts at convergence work than are novel research findings. The work involved in delineating a space or 'trading zone' (Galison, 1997) for productive discussion is not necessarily trivial. Negotiating the differences in language, culture and practice among communities is crucial in order to build up a shared understanding and to develop encounters that are seen to be mutually worthwhile. Is this a process that we are too quick to overlook in our rush to see tangible fruits of interdisciplinary labours?

Over the past 18 months, my activities at the Forum have also expanded to include a workstream on synthetic biology (Endy, 2005). Again, this initiative has an emphasis on the interactions among academic disciplines. The Forum was initially approached by researchers from the engineering and biological sciences departments at the University of Edinburgh, to see whether we might be willing to engage with them on some of the broader societal issues relating to synthetic biology. Our efforts have since become national, as we recently secured a three-year grant from four of the UK research councils to develop an interdisciplinary research network on synthetic biology.

There are now approximately 50 members of the UK Synthetic Biology Standards

(SynBioStandards) Network (www.synbiostandards.ac.uk), drawn principally from five universities: Cambridge, Edinburgh, Glasgow, Imperial College London and Newcastle. I help to coordinate the network together with an engineer and a plant scientist, and the focus for our activities relates to standards and characterization in synthetic biology. Standardization is an issue of potential interest from a wide range of disciplinary perspectives. To provide a few trivial and speculative examples, 'wet-lab' synthetic biologists might be concerned with standards for the purpose of research coordination and efficiency, computer scientists might wish to engage with some of the technical data-sharing aspects of standards, and social scientists might have an interest in exploring the implications of standard-setting for innovation trajectories. In this way, the issue of standardization provides an entry point or perhaps a 'boundary object' (Star & Griesemer, 1989) for developing interdisciplinary encounters and activities. As well as providing synthetic biology researchers in the UK with a forum in which to share information and discuss matters of relevance to the development of this nascent field, one of the anticipated outputs of the network will be in the form of multidisciplinary research proposals. Several EGN researchers are part of the SynBioStandards Network, and we hope to draw on our varied experiences in 'doing genomics and society' to help develop a productive network.

The attempts to build bridges across academic disciplines in both the plant genomics and the synthetic biology workstreams can be seen to parallel my personal journey as a natural scientist into the world of social science. The learning curve has been steep—my experiences indicate that the chasm between 'the two cultures' of the natural and social sciences runs deep (Snow, 1959), but thankfully does not seem completely impassable. After two years, terms such as 'normative' and 'epistemological' no longer seem as daunting, and the word 'regulation' does not automatically conjure up images of signalling pathways and feedback loops. However, a certain identity crisis has accompanied this process of change. No longer a 'real' scientist, but not yet a 'proper' social scientist, the 'interactional expertise' that one could say I am developing (Collins & Evans, 2007) seems now to cast me in a hybrid role that is part administrator, part facilitator, part collaborator and occasional contributor. The Forum as an institution could be said to have a similar identity.

Through its first five years of activity, the Forum has acquired considerable experience in crafting 'society and genomics' encounters involving a range of different groups and drawing on a variety of methods. These encounters often uncover interesting questions and avenues for further research. The challenge for our second phase of funding will be not to treat these questions as the endpoint of our activities, but rather to find ways of feeding them back into the research and policy process, and to exploit the growing networks that we are developing in order to pursue more scholarly and in-depth analyses of these timely and provocative issues. In this way, the Forum might become a more central and supportive node in ongoing efforts to 'do society and genomics'.

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